

## FREQUENTLY ASKED QUESTIONS

### What is the DOE Builders Challenge?

DOE has posed a challenge to the homebuilding industry – **to build 220,000 high performance homes by 2012**. Homes that qualify for the Builders Challenge must achieve a 70 or better on the EnergySmart Home Scale (E-Scale), meaning that these homes will use at least 30% less energy than a typical new home built to code. The E-Scale allows homebuyers to understand – at a glance – how the energy performance of a particular home compares with others. Through the Builders Challenge, participating homebuilders will easily differentiate their best energy-performing homes from other products in the marketplace, and have a way to make the benefits of these homes clear to buyers.

Through industry partnerships and existing programs, the Builders Challenge is promoting the use of market-tested and cost-effective energy efficiency strategies. The Challenge will support, recognize, and reward builders for achieving higher levels of energy efficiency. DOE's goal is that, by 2030, new home buyers will have the option to buy a cost-neutral Net-Zero Energy Home (NZEH) anywhere in the United States.

### When did the Builders Challenge begin?

DOE Secretary Samuel Bodman and DOE Assistant Secretary Alexander Karsner were joined by 22 builders to announce the Builders Challenge on Thursday, February 14<sup>th</sup>, 2008, during the International Builders Show in Orlando, Florida (38 builders committed to support the initiative by its launch).

### Who were the "Pioneer" Partners involved in Builders Challenge?

Actus Lend Lease, Nashville, TN  
Alvis Projects, Fresno, CA  
Artistic Homes, Albuquerque, NM  
Brownsville Affordable Homeownership Corporation,  
Planning and Community Development Department,  
Brownsville, TX  
Byrne & Byrne Contractors, Lancaster, CA  
Castle & Cooke, Florida, LTD, Winter Garden, FL  
Centex Homes, Pleasanton, CA  
Charter Building and Development Corporation,  
Albuquerque, NM  
Chuck Miller Construction, Inc., Hidden Springs, ID  
Clarum Homes, Borrego Springs, CA  
Ferrier Custom Homes, Fort Worth, TX  
Florida Custom Homes, Naples, FL  
Gainesville Regional Utilities  
G.W. Robinson Homes, Gainesville, FL  
Harvard Communities, Denver, CO  
Ideal Homes, Norman, OK  
John Wesley Miller Companies, Tucson, AZ  
Marc Rutenberg Homes, Trinity, FL  
Marquis Construction and Development, Holiday, FL  
Martha Rose Homes, Seattle WA  
New Tradition Homes, Vancouver, WA  
On Top of the World Communities, Inc., Ocala, FL  
Organum Development (Lily Valley), Hattiesburg, MS

Palm Harbor Homes, Plant City, FL  
Pinnacle Homes, Las Vegas, NV  
Premier Homes, Rancho Cordova, CA  
Pulte Homes, Las Vegas, NV  
Rural Development, Inc., Turners Falls, MA  
Schackow Realty and Development, Gainesville, FL  
Seastar Homes, Redding, CA  
Shroeders Homes, Venice, FL  
Skobel Development, Inc., Boca Raton, FL  
Spain & Cooper Construction, Gainesville, FL  
Stalwart Built Homes, Panama City, FL  
Stitt Energy Systems Inc., Rogers, AR  
Tiffany Homes, New Mexico  
Tommy Williams Homes, Archer, FL  
Treasure Homes, Sacramento, CA

#### *Partner Organizations*

BuiltGreen Colorado  
Cambridge Energy Alliance  
City of Brownsville, Planning and Community  
Development Department  
City of Portland Office of Sustainability  
Earth Advantage  
Energy Trust of Oregon  
North American Insulation Manufacturers Association  
Northwest Energy Efficiency Alliance  
Oregon Department of Energy

## What is the EnergySmart Home Scale (E-Scale)?

The E-Scale is an easy-to-understand tool that helps homebuyers and homeowners make smart energy decisions when purchasing, renting, or updating a home. It is designed to provide clear, objective answers to basic questions:

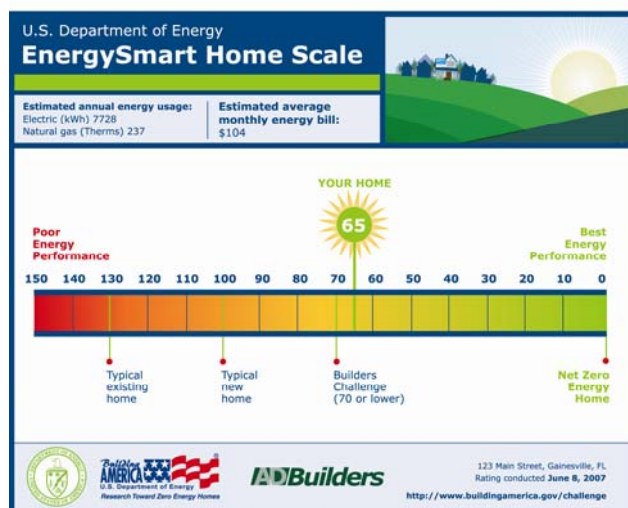
- Will this home help me save money on energy bills?
- How many “miles per gallon” does this home get?
- How does it compare to a typical new home?
- How close is it to the “ultimate” – a Net-Zero Energy Home?

**Estimated annual energy usage** is the projected amount of natural gas and electricity used annually by a home.

**Typical existing home** represents the average energy performance of the existing housing stock.

**Typical new home** represents the energy performance of a home built to code (2006 IECC).

**Energy Star** is 85 on the E-Scale.



**Estimated average monthly energy bill** is the estimated annual energy bill divided by 12 months.

**Builders Challenge (70 or lower)** represents the threshold at which a home must be built to comply with the Builders Challenge.

**Your Home** represents the verified annual energy performance estimate for a specific home. In this example, a home achieving a 65 on the EnergySmart Home Scale will use only 65 percent as much energy as a typical new home – 100 on the scale – saving about 35 percent in energy use on utility bills.

**Net-Zero Energy Home** A net-zero energy home annually produces with on-site renewable sources as much energy as it consumes. On-site renewable sources include energy collected on the site and used in the home (e.g., solar, wind). The site includes the home's footprint and the home site plan. The home should also provide an expected level of service and comfort.

A 70 on the E-Scale indicates that a home is approximately 30% more energy efficient than a typical new home built to code. A 60 on the E-Scale would be 40% more energy efficient. The ultimate goal is to get to 0 – a Net-Zero Energy Home.

Builders may place the E-Scale on or near the home's electric panel to show potential homeowners the energy performance achieved by that particular home or model. Participating builders and partner organizations can also:

- Place their logo on the E-Scale label with program or product names
- Augment the rating with estimates of annual energy cost savings – which may help homebuyers get better mortgage terms
- Include estimates of the carbon footprint associated with the energy rating

The E-Scale is based on the well established Home Energy Rating System (HERS) Index, developed by RESNET, the Residential Energy Services Network. For more information on the technical rating system behind the E-Scale, visit the Residential Energy Services Network at [www.natresnet.org/](http://www.natresnet.org/).

## How does a builder participate?

There are three different ways to meet the Builders Challenge: through a partner program; with prescriptive Builder Option Packages that lay out the most cost-effective design for a given climate (one in each climate qualifies for the Federal Tax Credit), or by taking the performance path. The performance path requires that the home be designed to perform between 70-0 on the E-Scale using software that has been accredited in accordance with the RESNET

software accreditation procedures. Both the prescriptive and performance paths require third-party verification by a qualified professional or a clearly documented quality control procedure. Qualified professionals include HERS raters, registered architects, and professional engineers. These professionals will rate the homes, assigning them the appropriate number on the E-Scale.

These paths are outlined in the table below:

Eligible Candidates	Pathways to Meeting the Challenge	Design & Performance Analysis	Minimum Required Performance	Verification Process
Any builder of new, U.S. housing including all single-family (attached and detached) and low-rise multi-family (3 stories or less)	1. Partner Program	Achieve an equivalent level of performance within a partner program	Equivalent performance as defined by the partner program and certified as equivalent by DOE	Partner specified quality assurance / control procedure
	2. Prescriptive	Build to the Builder Challenge - Builder Option Package (BC-BOP) guidelines for the appropriate climate	Meet all BC-BOP criteria for the climate	Third-party verification through a HERS rater or other qualified professional or company based quality assurance program
	3. Performance	Model high performance design using RESNET accredited software	Build to a maximum 70 on the E-Scale, plus Building America performance criteria	

### How much energy will be saved by the Builders Challenge?

- By constructing 220,000 homes to 70 on the E-Scale by 2012, participating builders will be taking the equivalent of 50,000 passenger cars off the road for an entire year and will save homeowners \$143 million on their energy bills.
- Over time, the initiative will target increasingly challenging performance levels. Cumulatively, by constructing 1.3 million high performance homes by 2030, participating builders will save their customers \$1.7 billion and take the equivalent of 606,000 cars off the road for one year. By making cost-effective NZEH available anywhere in the U.S, builders provide an invaluable service.

Initiative Goals	2012	2030
Builders Challenge E-Scale Threshold	70	0
Cumulative # of Homes from 2008	219K	1.3M
Cumulative Energy Savings (Quads, Primary)	0.015	0.178
Cumulative Energy Cost Savings	\$143M	\$1.7B
Cumulative Carbon Savings (Million Metric Tons)	0.231	2.799

*These numbers are best estimates based on currently available data.*

### How will the Builders Challenge help builders achieve high performance homes?

Through the five elements of the Challenge:

1. **Volunteering for the Challenge:** inviting American homebuilders to join in the voluntary Builders Challenge and commit to constructing high performance homes
2. **EnergySmart Homes Scale (E-Scale):** a scale that participating homebuilders will use to provide buyers with an objective rating of a particular house's energy efficiency
3. **National Outreach Campaign:** a public education effort to help drive homebuyer demand for high performance homes and to assist participating builders in their marketing
4. **Design Competition:** recognizing designers and increasing the supply of high-performance home plans
5. **Awards:** recognizing and rewarding participants who contribute to a critical mass of high performance home construction

These elements are being implemented through collaborative efforts by the U.S. Department of Energy with states, building industry associations, building trades, colleges and universities, consumer organizations, rating organizations, realtors, utilities, and energy efficiency program sponsors. Most important of all is the voluntary participation of homebuilders across the United States.

### How does the Builders Challenge relate to U.S. DOE's Building America program?

The Builders Challenge energy threshold and performance criteria for comfort, quality, and indoor environmental quality are based on over a decade of Building America Research and Development (R&D). The 70 E-Scale threshold required to meet the Challenge is 30% more efficient than a reference home based on the 2004 IECC.

Building America field research with custom and production builders demonstrates that this level of efficiency is achievable at cost-effective levels anywhere in the United States. The Building America systems strategies are the basis for the prescriptive pathways for meeting the Challenge in an effective manner. For more information on Building America, visit [www.buildingamerica.gov](http://www.buildingamerica.gov).

### How will the Builders Challenge achieve Net-Zero Energy Homes?

The Builders Challenge will follow behind the Building America program, which is expected to achieve cost-neutral Net-Zero Energy Homes by 2020. "Cost-neutral" means that the added first costs of system enhancements (when amortized over a 30 year period) are equal to the monthly energy cost savings which result from these enhancements. While the Building America program develops and field tests the technologies needed to cost-effectively move to higher levels of efficiency, the Builders Challenge will promote the implementation of proven strategies that builders can implement in any climate region.

The Builders Challenge threshold begins at 70 on the E-Scale and will stay at this level until 2012. As Building America strategies that achieve greater efficiency levels become available, the Challenge threshold will move steadily closer to NZEH. By 2030, builders will have the methods and technologies to cost-effectively construct Net-Zero Energy Homes anywhere in the United States.

### Is the Builders Challenge expected to have a large market share?

The real value of the Builders Challenge will be the impact on the entire housing market in gaining acceptance of new energy savings products and techniques. Experience from the Building America program shows that when first adopters demonstrate that a product can be used safely and effectively, the market penetration of the product increases rapidly.

The current market share of homes at 70 on the E-Scale is estimated to be just over 1.5% of annual new home production. Through Builders Challenge outreach and support to builders, and by driving consumer demand through education around the E-Scale, the market share is expected to rise to over 3%-5% of the new homes market. Every time the energy level moves closer to zero, we anticipate the market share to drop initially until the learning curve and comfort levels are achieved among builders and contractors. This will allow for market differentiation as well as higher levels of energy, cost savings, and carbon reductions.

### How does the Builders Challenge relate to ENERGY STAR?

ENERGY STAR homes rate as an 85 on the E-Scale in most regions of the country (80 is required in Climate Zones 6-8), which is 15% above current energy codes. At roughly 30% above energy codes or 70 on the E-Scale, the Builders Challenge provides higher levels of energy efficiency for builders who have already achieved ENERGY STAR and want to differentiate themselves in terms of energy efficiency. A home meeting the Builders Challenge will automatically meet ENERGY STAR.

### How does a 70 on the E-Scale relate to a "30% better than building code" home?

At first glance, a 70 on the E-Scale may seem the same as "30% better than code." However, the two terms differ because they measure different categories of energy usage. Building codes like the IECC regulate only the thermal loads in a home (e.g. heating and cooling), while the E-Scale estimates whole-house energy usage (heating, cooling, water heating, lighting, appliances, and onsite power generation - if applicable). So "30% better than building code" refers to an enhanced performance level on a smaller slice of a home's energy usage, compared to the E-Scale value. In essence, a 30% better than code building is more like an 85 on the E-Scale (approximately), assuming energy uses not regulated by current residential codes (e.g., lighting) are at minimum efficiencies. As building codes evolve, and possibly regulate other forms of energy usage such as lighting, these two terms could be more in sync with each other in the future.



## How does the E-Scale relate to the International Energy Conservation Code (IECC)?

The quantitative basis of the E-Scale is the HERS Index. On the HERS Index, a score of 100 represents the current “code compliant” home. Each point lower than 100 is 1% more efficient than the code compliant home. The HERS Index is based on a reference comparison home, which incorporates the requirements of the 2006 International Energy Conservation Code (IECC) as well as other baseline building requirements such as federal minimum HVAC equipment efficiencies. Although future revisions of the IECC may increase performance requirements for new homes, DOE intends to keep its reference home tied to the 2006 IECC for the foreseeable future. The ultimate goal of the Challenge is widely available, cost-effective Net Zero Energy Homes by 2030, meaning that the building produces as much energy as it uses.

## Does the Builders Challenge E-Scale apply to retrofits?

Yes, that is why the E-Scale goes beyond the typical new home that is built to code (100). A typical existing home would be roughly 130 on the E-Scale. There is clearly a lot of room for energy efficiency improvements in existing homes. The DOE will work with Ecobrokers, and the National Association of REALTORS to educate real estate agents, Home Performance with Energy Star contractors and consumer education/outreach groups ensure the value of energy efficiency in terms of monthly operating costs, quality and maintenance is known. The E-Scale label, which is placed on or next to the electric panel, provides a record of the home’s energy performance at the time of sale or retrofit of the home.

## What about communicating the carbon footprint of the home?

Some partners, for instance those in the Northwest, are interested in including a carbon footprint on the E-Scale. DOE is considering options for including a carbon footprint as part of the Builders Challenge. For example, should the carbon footprint be based solely on the operational energy use of a home or, should it include the embodied energy in the building products as well? Another consideration is how to convert energy usage to carbon emissions within the context of a national program, since homes in some parts of the country utilize power from carbon-friendly energy sources (e.g., hydropower in the Northwest) while homes in other areas rely on fossil-generated power.

## What about the Federal new home tax credit?

The Federal new home tax credit was extended through 2008. The U.S. Department of Energy and its partners support the renewal of Federal tax credits, which provide an additional incentive for high performance homes. Since the Challenge seeks to leverage other programs and incentives, the prescriptive packages being developed to meet the Challenge in different climate zones (the BOPs) will include at least one energy package that will qualify the house to meet the Federal new home tax credit. Consequently, builders can, in one step, meet the Challenge and also position the home to qualify for the tax credit.

## How does the Builders Challenge relate to other programs?

The residential marketplace has several national programs related to energy efficiency and sustainability. The Challenge will help to drive increased market penetration and recognition of high performance homes in a way that supports and leverages existing programs. The program is designed to complement existing programs, and equivalency measures are being developed to ensure that will comply with partner programs with homes performing at a certain level will also qualify as meeting the Builders Challenge.

### What about NAHB's National Green Building Standard?

The Builders Challenge goal is to "put the EE" in GrEEn. By working with and supporting efforts like the NGBS, the nation is much more likely to achieve cost-effective and affordable energy-efficient homes. Much like the NGBS Bronze level achieves at least ENERGY STAR® performance levels for energy, an NGBS Silver rating achieves an energy efficiency level that meets the Builders Challenge. The NGBS Gold and Emerald levels are currently well beyond the Builders Challenge threshold. Builders achieving NGBS Silver or higher are eligible for the Builders Challenge and can take advantage of its benefits including the E-Scale, financial incentives, marketing templates, and national recognition by the DOE. DOE commends NAHB for featuring exceptional energy performance in the National Green Building Standard (NGBS).

### Why aren't builders already doing this?

Top Reasons Builders Are Not Already Doing This...	How the Builders Challenge Helps...
<b>1. Market Demand</b> People would still rather have granite counter tops	In NAHB Research Center's market research (12/07), 22 percent of consumers said if they had an extra \$5,000 they would purchase upgraded countertops, but 26 percent said they would spend it on energy efficiency improvements.  The Builders Challenge will drive demand through education around the EnergySmart Home Scale which helps consumers understand energy use and benefits.
<b>2. Cost</b> <ul style="list-style-type: none"> <li>• Don't believe cost-neutral</li> <li>• Economies of scale</li> <li>• Learning curve</li> </ul>	The Builders Challenge will link builders to proven cost-effective strategies, prescriptive option packages and training. Case studies with real numbers combined with consumer education will provide convincing evidence to builders and homebuyers alike.
<b>3. Proof/Guarantees</b> <ul style="list-style-type: none"> <li>• Want data on products/processes</li> <li>• Want to limit liability</li> </ul>	The Builders Challenge will provide case studies and work with manufacturers to provide necessary product and system information. All of the systems and approaches needed to meet the Challenge are field tested and in the marketplace.
<b>4. Unaware of resources</b> Awareness of ENERGY STAR, HERS Index and Building America is minimal	Volumes of good information exist, but both builders and consumers are unaware of it.  The Builders Challenge will market the availability of resources through the Internet as well as industry and consumer media
<b>5. Just don't buy it</b> Some still think it is a fad	The 2007 Green Building Survey produced by Reed Business Information reported that when builders were asked to agree or disagree with the statement "green building is a fad" – 67 percent of respondents said they disagreed, 40 percent that they <b>strongly</b> disagreed, 10 percent were neutral, 19 percent agreed, and only 3 percent strongly agreed. Clearly, this audience believes green building is a growing interest that won't fade. And beyond opinions, real evidence of a national drive for greater energy efficiency across all sectors can be seen in federal legislation (new fuel economy standards for cars), state initiatives (renewable portfolio standards), and an increasing consumer appetite for efficient products (hybrid vehicles).

### Is there any third-party verification of this energy performance?

Yes. The energy rating for the home will be conducted by RESNET-certified energy raters for the performance pathway. RESNET has an established system for quality assurance for raters as well as providers (who oversee the raters). See the National Home Energy Rating Standards at <http://www.resnet.us/standards/>. This is the same system which underlies the Energy Star homes program. The Builders Challenge will also require third-party verification of Builders Challenge Quality Criteria.

### Does the E-Scale just measure electric usage?

The E-Scale is fuel-neutral and takes into consideration all types of energy including natural gas, propane, oil, and renewables. Different modeling software can be used to develop the E-Scale rating for a house, all of which comply with RESNET ([www.natresnet.org](http://www.natresnet.org)) standards. These software packages do have capabilities to model the fuel use, efficiency, and the operating cost of wood-based systems like a wood stove. In general the more that is known about a heating system (rated efficiency, cost of wood), the more accurate the modeling result will be. The E-Scale will be able to incorporate energy consumption and energy saving data for these types of systems, as long as they are modeled in the energy analysis software.

### How do I get more information?

For more information, visit [www.buildingamerica.gov/challenge](http://www.buildingamerica.gov/challenge)

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